WHAT IS CLAIMED IS

1. A composition for forming an anti-reflective coating on a semiconductor substrate, comprising:

a polymer containing fluorine; and

a solvent for dissolving said polymer.

2. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 1,

wherein said polymer contains at least one of polyimides, acrylic polymers, polymers having an alicyclic structure and fluorocarbon resins formed by homo-polymerizing or co-polymerizing fluorine-containing monomers.

3. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 2,

wherein the fluorine-containing monomers comprise at least one of fluoroolefines, fluorovinylether, vinylidene fluoride, vinyl fluoride, chlorofluoroolefines, and fluorovinylether having carboxylic groups or sulfonic groups.

4. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 1,

wherein said polymer contains 10% by weight or more fluorine atoms.

5. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 2,

wherein said polymer contains 10% by weight or more fluorine atoms.

6. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 3,

wherein said polymer contains 10% by weight or more fluorine atoms.

7. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 1,

wherein said polymer has a cross-linked structure.

8. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 2,

wherein said polymer has a cross-linked structure.

9. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 3,

wherein said polymer has a cross-linked structure.

10. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 4,

wherein said polymer has a cross-linked structure.

11. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 1,

wherein said solvent comprises at least one of alcohols, aromatic hydrocarbons, ketones, esters, chlorofluorocarbons, and super pure water.

12. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 2,

wherein said solvent comprises at least one of alcohols, aromatic hydrocarbons, ketones, esters, chlorofluorocarbons, and super pure water.

13. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 3,

wherein said solvent comprises at least one of alcohols, aromatic hydrocarbons, ketones, esters, chlorofluorocarbons, and super pure water.

14. The composition for forming an anti-reflective coating on a semiconductor substrate according to claim 4,

wherein said solvent comprises at least one of alcohols, aromatic hydrocarbons, ketones, esters, chlorofluorocarbons, and super pure water.

15. A method for manufacturing a semiconductor device, comprising:

an anti-reflective coating forming step for forming an anti-reflective coating by coating the composition for an anti-reflective coating according to claim 1 on a semiconductor substrate;

a resist film forming step for forming a resist film containing fluorine on the anti-reflective coating formed in said anti-reflective coating forming step; and

an exposure step for radiating exposure light onto the resist film formed in said resist film forming step.

16. The method for manufacturing a semiconductor device according to claim 15,

wherein said anti-reflective coating forming step comprises a heating step for heating the semiconductor substrate on which the anti-reflective coating is formed.

17. The method for manufacturing a semiconductor device according to claim 16,

wherein said heating step is performed at a temperature between 100°C and 250°C for 30 seconds to 60 minutes.

18. The method for manufacturing a semiconductor device according to claim 16,

wherein said heating step is performed in an oxygen atmosphere.

19. The method for manufacturing a semiconductor device according to claim 16,

wherein the thickness of the anti-reflective coating is made 150 nm or less in said heating step.

20. The method for manufacturing a semiconductor device according to claim 15,

wherein the wavelength of the exposure light radiated in said exposure step is 254 nm or less.